

# the way to encourage

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## The Way to Encourage Green Building in Indonesia

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### Abstract

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Nowadays, in several major cities in Indonesia, such as Jakarta and Surabaya, many have tall buildings and still continue to do the construction of high rise buildings. There are several factors that affect it, such as the limited land for housing, economic growth, migration in search of employment opportunities in the city, and other factors. The purpose of this paper will describe the role of government, Green Building Council Indonesia (GBCI), public and private companies which will support the implementation of Indonesia "Go Green" program on sustainable building and construction. Furthermore, collecting primary data for preliminary survey is using a questionnaire to determine people perception about green building. The secondary data is collecting from government, public & private company, and GBCI. Those data is analysed by SPSS version 17 and technical analysis is Cramer correlation. The result showed that government has laws and regulations to support sustainable development. Developers, contractors, private and public companies will be involved to construct green buildings and green homes. GBCI as an organization that provides an assessment of the design, construction and operation of building systems with a rating of "GREENSHIP", also include an assessment of the existing buildings and integrated with new technologies. The preliminary survey result showed that people do not know much about the role of GBCI, but they believe that GBCI can perform their duties in green building certification. They also believe that University can better provide education about sustainable development program to resolve global warming.

**Keywords:** green building, GBCI, University

## INTRODUCTION

In the development process, the construction sector is contributed the largest carbon emissions to global warming. More than 60% of exhaust emissions consist of compound CO<sub>2</sub>, SO<sub>2</sub> and methane gas is produced by construction industry including Real Estate development (GBCI, 2010). Therefore, business property and real estate sector have responsible for handling the problem.

The shift towards property developments in Indonesia show a growing trend that leads to the green concept. The associated parties with property development ought to apply the principles of green design and construction. The architecture, contractors, and developers are trying to design, construct, and develop buildings or housing that meets the regulation of green. It is expected to change a basic lifestyle that cares about the environment and saving our planet. Indonesia has been starting a green concept through Green Building Council which is the concept of sustainable development as applied to the building industry.

<sup>1</sup> Green Building Council Indonesia (GBCI) is an independent institution (non-government) and non-profit organization which are fully committed to education of people in applying best practices and facilitate the transformation of the global sustainable construction industry. It was starting by seven (7) initiator and established in April 2008 consist of individual professional and practitioner (Nasir, 2012). GBCI is an Emerging Member of World Green Building Council (WGBC), based in Toronto, Canada.

Furthermore, the action of GBCI will synergy among <sup>8</sup> professional construction services, industrial building and property sector, government, educational and research institutions, professional associations and community care environment. For example, government as

regulator, private sector, and professionals can involve in this role. Institutions such as the Ministry of Finance and Bank Indonesia can facilitate the funding scheme. The building owner, both government and private, also could try to implement the concept of green buildings. The professionals as an experts and entrepreneurs are expected participation by increasing the competence, and join with government for the accreditation process.

This paper will describe the role of government, GBCI, public and private companies in activities which support implementation of Indonesia “Go Green” program in sustainable building and construction. In the last section, this paper also describes the preliminary survey of people perception about GBCI and sustainability.

### **The Government and GBCI in sustainability building**

In 2020, Indonesia has a target of reducing carbon emissions 26% to contribute reduce global warming that affects people lives. Therefore, the government issued several regulations related to the construction of buildings and housing. It is expected that the construction of buildings, houses and existing buildings have been established leading to sustainable development. There are several policy instruments which is connected to sustainable in building, construction and environment:

1. Law No. 28 of 2002 about Buildings
2. Law No. 30 year 2007 about Energy
3. Law No. 18 of 2008 about Waste Management
4. Law No. 32 year 2009 about Environmental Protection and Management
5. Ministry of Environment No. 8 year 2010 about Criteria and Environmental Friendly Building Certification
6. Ministry of Public Works No. 29/PRT/M/2006 on Guidelines of Requirement for Technical Building
7. Ministry of Public Works No. 30/PRT/M/2006 on Technical Guidelines of Facilities and Accessibility in Building and Environment

8. <sup>3</sup> Ministry of Public Works No. 05/PRT/M/2008 on Guidelines of Supply and Open Green Space Used
9. Ministry of Health No. 1405/MENKES/SK/XI/2002 on Requirements of Environmental Health Work in Office and Industrial
10. Ministry of State Housing No. 32 year 2006 instruction areas and environment ready to build
11. Instruction President No.13 year 2011 on Saving Water and Energy
12. Governor Rule DKI Jakarta No.38 year 2012 on Green Building (GBCI, 2012)

Adiwoso, Prasetyoadi and Savitri (n.d: p.3-4) described that the Ministry of Environment (KLH) promotes Sustainable City <sup>1</sup> through "Program Bangun Praja", and the program <sup>1</sup> aims to improve environmental management performance, covering up the management of building footing and green open space (including shade), the management of public facilities, pollution control and waste water. Secondly, <sup>1</sup> the Ministry of Public Works (PU) and elements such as Directorate of Technical Planning and Settlements Development, Directorate General "Cipta Karya" and Directorate Development and Restructuring Settlements are committed to support issues related to Green Building. <sup>1</sup> Together, Regional Development Agency revise the law on regulation of building construction activities from design phase to implementation with eco-friendly site and improved <sup>1</sup> RUTR (general plan spatial) and RTDR (spatial details of the plan). The aims are optimized management of land use and space structures. Thirdly, <sup>7</sup> the Ministry of Energy and Natural Resources (EMR) makes regulations about building efficiency to increase people awareness of energy efficiency in industry and construction <sup>1</sup> planning. Furthermore, <sup>1</sup> the Directorate General of Taxes of the Republic of Indonesia and the Ministry of Finance will active to provide incentives and disincentives to ease the procedures and policies related to tax rates on energy-efficient sustainable buildings, but the realization of tax incentive for green building has been no clarity.

GBCI as independent organizations which is concerned about sustainable development has published GREENSHIP since 20 September 2011. The award is given to existing, new building, and housings that meet rating tools of Green Building criteria. There are six criteria such as:

1. Appropriate Site Development (ASD)
2. Energy Efficiency Conservation (EEC)
3. Water Conservation (WAC)
4. Material Resources and Cycle (MRC)
5. Indoor Air Health and Comfort (IHC)
6. Building Environment Management (BEM)

More information can be found on the GBCI website [www.gbcindonesia.org](http://www.gbcindonesia.org).

GREENSHIP New Building version 1.1 is valid from February 23rd, 2012. The setting of the criteria is delivered in the value of buildings with the achievement in a certain points that will determine the rating of new building or existing building as shown in the table 1.

**Table 1. Credit Criteria of Greenship**

Rating Category	Criteria	Point	%
Appropriate Site Development	8	17	16,8%
Energy Efficiency and Conservation	7	26	25,7%
Water Conservation	8	21	20,8%
Material Resources and Cycle	7	14	13,9%
Indoor Health and Comfort	8	10	9,9%
Building Environmental Management	8	13	12,9%
<b>TOTAL</b>	46	101	100,0%

Source: Rating Development Department GBCI, February 2012

The rating system considers a simplicity, applicability and availability of technology for assessment and integration with local regulations.

**Table 2. The GREENSHIP Achievement**

Achievement	Design Recognition		Final Assessment	
	Minimum Point	%	Minimum Point	%
Platinum	56	73%	74	73%
Gold	43	57%	58	57%
Silver	35	47%	47	47%
Bronze	27	35%	35	35%

Source: Rating Development Department GBCI, February 2012

The purpose of Greenship is applied to the best practice in the building industry in order to form a quality environment through new and existing buildings awakened thus improving the quality of life and health. Hopefully, by the criteria Greenship, the current environmental problems can be solved through a system of rating and weighting values. This will stimulate research and technological advances in the building industry in Indonesia and create a variety of appropriate technologies in its application.

Adiwoso, Prasetyoadi and Savitri (n.d: p.2) stated that green building will show high performance building when responsive in environment sector, in order to create a healthy life either in the residence or place of work and provide economic benefits. Construction also impacts on the environment, because buildings consume electricity and water each year and produce waste. However, the green building implementation could significantly <sup>5</sup> reduce or eliminate negative environmental impacts, reduce operating costs, enhance building marketability, increase worker productivity, and reduce potential liability from indoor air quality problems.



## Implementation and Achievement of Sustainable Building and Construction in Indonesia

Indonesia faces challenges in implementing Sustainable Development to create a perception of a same-consciousness and collective vision to save the environment. Searching the best solution should be applied not only for new buildings, but old building also. Yudelson (2008) stated that building owners feel that tenants benefit from green features, but tenants are not always willing to pay higher rents for those benefits. Although the cost of green building construction is higher than the cost of construction in general, building owners also benefit from the low operating costs, tax benefits, reduced risk of sick employees, increase employee productivity, stakeholder goodwill and marketing increased due to green building concept. Developer gets help ease permitting and special permits from regulatory agencies (Allen, 2008, p.254).

There are several buildings that have been constructed or will be constructed continue to implement GREENSHIPS certification from the GBCI, as shown in table 3.

**Table 3. Green Building on Progress of Registration and Certification**

Type of Building	On Registration		Registered		Certified	
	New Building	Existing Building	New Building	Existing Building	New Building	Existing Building
Healthcare	1	-	-	-	-	-
Commercial	2	-	1	1	-	-
Office	13	3	14	2	-	2
Hotel	1	-	1	-	-	-
Apartment	-	-	2	-	-	-
School	-	-	3	-	1	-
Church	-	-	1	-	-	-
Total	17	3	22	3	1	2

Source: [www.gbci.org](http://www.gbci.org) on February, 28th 2013

GBCI has analyzed the ranking, criteria certification, and the percentage of saving energy in several green buildings as seen in Table 4.



**Table 4. Saving Energy in Green Building**

No	Building	City	Ranking	Date	Criteria	Note
1	Main Building Ministry of Public Work	Jakarta, West Java	Platinum	20-9-2011	Design Recognition	Saving Energy 30%
2	Campus Institute Technology & Sains Bandung	Cikarang, West Java	Gold	1-12-2011	Design Recognition	Saving Energy 33.4%
3	Main Management PT. Dahana Office Building	Subang, West Java	Platinum	20-12-2011	New Building	Saving Energy 42%
4	Grand Indonesia Office Tower	Jakarta, West Java	Platinum	21-12-2011	Existing Building	Saving Energy 30%
5	Rasuna Tower	Jakarta, West Java	Gold	4-4-2012	Design Recognition	
6	Sampoerna Strategic Square	Jakarta, West Java	Gold	27-9-2012	Existing Building	Saving Energy 40%
7	Bank of Indonesia	Solo, Middle of Java	Platinum	Oct 2012	Design Recognition	
8	Graha Kirana Megah Tower	TB Simatupang, Jakarta	Target Platinum	Nov 2012	Design Recognition	Saving Energy 45.3%
9	Prasetya Mulya Business School	Jakarta, West Java	Target Platinum	Dec 2012	Design Recognition	Saving Energy 43.6%
10	Pan Brothers Main Office	-	Target Platinum	Dec 2012	Design Recognition	Saving Energy 41.2%
11	Training Building KEBTKE	-	Target Platinum	Dec 2012	Design Recognition	Saving Energy 23.4%

(Sulistiyanto, n.d: p.43-48; [www.gbcindonesia.org](http://www.gbcindonesia.org))

The buildings above are sampling of buildings that have certified or in the process of application for certification Greenship. Those building had target standard or reached to reduce energy consumption between 23% - 45%, then this will show progress for reducing carbon emission in Indonesia. Going forward, hopefully all the buildings in major cities in Indonesia have a green certificate.

### People Perception about GBCI and Green Activities

Based on the preliminary survey in Surabaya which is starting from 18 to 22 November 2012 to 100 people, only 68 people reply the questioner. The result of survey showed on below analyses.

**Table 5. Demography Data**

Description		%	Know About GBCI	
			Yes (27.9%)	No (72.1%)
Gender	Female	50.0	8	26
	Male	50.0	11	23
Age	Under 18 years	7.4	2	3
	18 – 29 years	52.9	10	26
	30 – 50 years	27.9	5	14
	Over 51 years	11.8	2	6
Residence	Homeowner	27.9	8	11
	Rented home	5.9	1	3
	Apartment	11.8	2	6
	Rented Apartment	7.4	-	5
	Parent's home	26.5	6	12
	Boarding house	20.6	2	12
Jobs	Public officer	11.8	1	7
	Private employees	32.4	7	15
	Students	23.5	6	10
	Entrepreneur	25.0	4	13
	Professional	7.4	1	4

Table 5 showed that people only knows 27.9% about GBCI's role in supporting Indonesia "Go Green" program through buildings certification which meets green concept. This shows that people is really not familiar with GBCI and their role. Furthermore, GBCI need to promote the organization as well as their participation has been related to a green program in Indonesia to the people.

The survey result in table 6 showed the percentage of people response about GBCI and their perception about some issues in sustainability development, participating from government,

contractor or developer, building owner, and university in Indonesia about “Go Green” Program.

**Table 6. People Perception in Sustainability Development**

	Strongly disagree or disagree	Strongly agree or agree
I am concerned at current related to consumption of natural resources (water, electrical, fuel) and pollution/ damage of the environment	1.4%	98.6%
I believe that current economic conditions will have a negative impact on our people future generation	25.0%	75.0%
I believe that GBCI will help create an Indonesia "Go Green"	7.4%	92.6%
I believe that the government has made a priority of sustainable development with planning, developing, and activating programme that can be applied in day-to-day	48.5%	51.5%
I believe that the contractor / developer who undertake the construction of sustainable development will be solve environmental problems	39.7%	60.3%
I believe that the building owner will apply sustainable development and solve environmental problems	41.2%	58.8%
I believe that the university has a program of sustainable development to educate the students and the people about global warming	11.8%	88.2%
I believe that everyone around me will support sustainable development and solve environmental problems	35.3%	64.7%
I want to help create a sustainable environment	2.9%	97.1%
I will not support activities related to the nature protection	86.7%	13.3%
I currently use recycled products more than 50%	55.9%	44.1%
I try to use products that are environmental friendly	7.4%	92.6%
I feel at current that no need to change the behaviour of energy consumption	94.1%	5.9%
My neighbourhood has not support to Indonesia "Go Green"	38.3%	61.7%
My work environment does not support programme Indonesia program "Go Green"	57.3%	42.7%

The survey showed that respondents care about consumption patterns of natural resources that will be damaging the environment, so it will be impacted on future life. However, more respondents believed if GBCI and the university will socialize or implement activities that support sustainable development. The involvement of government, contractors or developers, property owners, as well as their friends at neighbourhood or work place is not too expected. Respondents trust themselves to take initiative and act in supporting Indonesia “Green” program.

Based on data from Table 6, the analysis is continued in non parametric statistical by Cramer Correlation, because type of data is nominal and ordinal. This tool analyses relation between demographic respondent and people perception in sustainability development as seen on Table 7.

**Table 7 The Cramer’s Correlation**

<b>Relation</b>	<b>Cramer’s Value</b>	<b>Approximate Sig.</b>
Age * I believe that the university has a program of sustainable development to educate the students and the people about global warming	0.306	0.047 < 0.05
Age * I will not support activities related to the nature protection	0.309	0.021 < 0.05
Residence * I believe that current economic conditions will have a negative impact on our people future generation	0.388	0.025 < 0.05
Jobs * I am concerned at current related to consumption of natural resources (water, electrical, fuel) and pollution/ damage of the environment	0.340	0.047 < 0.05
Know about GBCI * I believe that the contractor / developer who undertake the construction of sustainable development will be solve environmental problems	0.406	0.011 < 0.05

Based on table 7, the survey described some of the variables have a correlation. Firstly, the role of university provides education in green building and sustainable development related to the confidence of respondents in line with age maturity. It will have an impact on their behaviour to protect an environment. Secondly, economic conditions can have a negative impact which is correlated with consumption patterns or lifestyles of respondents in choosing a place to live. Thirdly, the field work of respondents also correlated with pattern consumption of natural resources, so this pattern is carried in daily life that may cause pollution or environmental destruction. Finally, respondents' knowledge of GBCI's role is correlated with their belief in the role of contractor or developer to build a green building or other sustainable development.

### **The Conclusions and Recommendations**

The government should focus on environmental care program and needs real action, not just focus on laws and regulation publication. It will build public awareness to attract them involved on that program. Furthermore, government can work with GBCI and public or private companies, contractors, developers and universities to tackle global warming and participate more actively to promote Indonesia Green Program. The next important things are self-awareness to initiative a green program in daily life, for example savings in energy and water consumption and manage waste properly.

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## Appendix

### List of Certified Building

	Name	Picture
1	<p>Main Management PT. Dahana Office Building</p> <p><b>Number Certificate:</b> 001/RP/NB/I-2012</p> <p><b>Rating:</b> Platinum, 2012-2015</p> <p><b>Score:</b> Total 83 (82 %) from Maximum Score 101</p> <p><b>Category Certificate:</b> New Building-NB</p>	

2	<p>Grand Indonesia Office Tower</p> <p><b>Number Certificate:</b> 001/PP/EB/XII-2011</p> <p><b>Rating:</b> Platinum, 2011-2014</p> <p><b>Score:</b> Total 96 (82 %) from Maximum Score 117</p> <p><b>Category Certificate:</b> Existing Building-EB</p>	
3	<p>Sampoerna Strategic Square, PT. Buana Sakti - Jakarta</p> <p><b>Number Certificate:</b> 002/PP/EB/IX-2012</p> <p><b>Rating:</b> Gold, 2012-2015</p> <p><b>Score:</b> Total 72 (61,54 %) from Maximum Score 117</p> <p><b>Category Certificate:</b> Existing Building-EB</p>	



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